

TIBIAL PREPARATION APPARATUS AND METHOD

FIELD OF THE INVENTION

[0001] The present invention relates to an apparatus and method for tibial preparation.

BACKGROUND OF THE INVENTION

[0002] During knee replacement surgery the tibial surface may be prepared for implantation of a tibial component of a knee implant. Several preparation instruments may be used to assist the surgeon in this procedure. A surgeon generally uses, for example, a tibial template and/or trial tibial tray to determine the tibial implant size, as well as various cutting, punching or reaming guides to make the appropriate cuts or reamed surfaces in the bone, and to ensure a proper alignment prior to implanting the tibial component.

[0003] The tibial preparation procedure typically starts with making an initial tibial plateau cut on the proximal tibia of the knee joint. Using a tibial template, the size of the trial tray is then selected and placed over the resected surface of the tibia. After trial reduction, the trial tray is removed and a punch guide is placed on the resected tibial surface. The tibial bone is cut or reamed through openings in the punch guide and trial tray to prepare the bone to receive the tibial component of the implant.

[0004] During the tibial preparation procedure, the surgeon may need to remove and reposition or re-orient a preparation instrument using a handle

attached to the instrument. In the existing art, the handle is centrally attached to the instrument, and is often removed and re-attached, to avoid tissue impingement or provide clearance, for example. The prior art handle may obscure the view of the trial trays or guides and make alignment evaluation cumbersome, and generally reduces the manipulative clearance available to the surgeon.

[0005] Accordingly, improved tibial preparation instruments that avoid some of the problems associated with the prior art handles are desirable.

SUMMARY OF THE INVENTION

[0006] One embodiment of the invention provides an apparatus for preparing a tibia for knee surgery. The apparatus includes a tibial base having a center axis, and a handle coupled to the base at an anterior base location that is offset relative to the center axis.

[0007] Another embodiment of the invention provides an apparatus for preparing a tibia for knee surgery. The apparatus includes a reversible base that is operable to engage in contact a surface of the tibia and has a center axis. The apparatus also includes a link coupled to the base at a position that is medially offset from the center axis. A handle is coupled to the link.

[0008] Another embodiment of the invention provides an apparatus for preparing a tibia in knee surgery. The apparatus includes a tibial base having a center axis, and a handle coupled to the base at a first end. The first end has a

medially offset cutout oriented to provided a lateral clearance relative to the center axis of the base.

[0009] Another embodiment of the invention provides a method for tibial preparation for a knee implant procedure. The method includes selecting a tibial base, and coupling the tibial base with a handle at a position medially offset relate to a center axis of the tibial base.

[0010] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

[0012] FIG. 1 is a perspective view of an embodiment of a tibial preparation apparatus according to the present invention, the apparatus shown in the environment of a right knee tibial bone.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] The following description of the embodiments is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

[0014] FIG. 1 illustrates an embodiment for an apparatus 100 used to prepare a tibial surface 90 for knee surgery. The apparatus 100 is shown in the exemplary environment of a right knee tibial bone 80. The apparatus 100 includes a tibial base 110, a handle 120, and a link 130. The tibial base 110 can be a tibial template, a trial tibial tray or plate, a punching, reaming, cutting, or alignment guide or jig, or any other component that may be placed on the tibial surface 90 in preparation for knee replacement surgery. The tibial base 110 may be reversible in some embodiments, such as, for example when the tibial base 110 is a tibial template. The tibial base has a periphery 112 and a center axis "A", which is generally, but not necessarily, an axis of symmetry of the tibial base 110. The tibial base 110 may be temporarily secured to the tibial surface 90 with pins (not shown) inserted through fixation holes 140. The center axis A may lie on the median plane of the tibia 80 when the tibial base 110 is positioned on the tibial surface 90.

[0015] The handle 120 is an elongated member that may include a longitudinal slot 122 to provide weight reduction to the apparatus 100 without compromising its strength. The handle 120 may include one or more sleeves 124 for inserting alignment rods, such as rods or pins or drill bits for setting rotation along the tibial tubercle or second metatarsal, for example. The handle 120 has a proximal end 126, a distal end 128, and a longitudinal axis "B" which coincides with the center axis A of the tibial base 110 when the handle 120 is attached to the tibial base 110. The handle 120 is used to conveniently move the

base 110 relatively to the tibial surface 90, but it can also be used to verify rotational, varus/valgus, and flexion/extension alignments, for example.

[0016] Although the handle 120 may be centered about the center axis A of the tibial base 110, such that the longitudinal axis B of the handle coincides with the center axis A of the base 110, at least a partial offset in the medial direction ("medial offset") is provided at the base-handle connection. The medial offset, generally designated as 150, may be constructed by a variety of structures in combination with a handle 120 that is integral to the base 110, or a modular handle 120 that can be removably attached to the base 110, or with a link 130 used as an intermediate structure between the base 110 and the handle 120.

[0017] In one embodiment, the link 130 extends from a medially offset anterior position 160 on the periphery 112 of the base 110, and couples the base 110 to the proximal end 126 of the handle 120. The link 130 has a center axis C which is medially offset from the axis A at an angle β , which provides a measure for the medial offset 150. The angle β may be, for example, about 15° to about 45° degrees.

[0018] The medial offset 150 provides a desirable clearance that helps avoid lateral tissue impingement during the tibial preparation procedures, which include trial sizing, alignment, punching, reaming, cutting, etc. Furthermore, the medial offset 150 enhances the visibility of the tibial base 110, the periphery 112 of the tibial base 110 and the tibial bone 80, and also provides manipulative clearance for the surgeon.

[0019] The link 130 may include a curved portion 132 which provides a smooth transition between the base 110 and the handle 120. The link 130 may be modular, or integral to the base 110, or integral to the handle 120. Accordingly, the link 130 can be removably coupled to the base 110 or to the handle 120 or to both. In another embodiment, the handle 120 is directly coupled to the tibial base 110 at the medially offset anterior position 160 and includes a cutout that defines the medial offset 150.

[0020] In operation, the apparatus 100 is selectively placed on the tibial surface 90, such that the medially offset position 160 is on the medial and anterior side of each knee. For a reversible base 110, this is accomplished by rotating the apparatus 100 by 180° for use from a right knee to a left knee, and conversely. In applications in which the tibial base 100 is not reversible, two mirror image apparatuses 100, one for each knee, can be provided.

[0021] The description of the invention is merely exemplary in nature and, thus, variations that do not depart from the gist of the invention are intended to be within the scope of the invention. Such variations are not to be regarded as a departure from the spirit and scope of the invention.